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ABSTRACT

To aid in the successful interdisciplinary team planning of vocational education, this study sought to determine: (1) which of certain selected skills in agricultural, distributive, home economics, office, and trade and industrial occupations are being taught at the secondary level, and (2) the similarities in selected instructional content in the various vocational education courses in the secondary schools of Mississippi. Data pertaining to the skills taught were obtained from 278 high school vocational education teachers. Analysis of the data revealed little similarity of instruction among the vocational education areas for the skills studied. However, 15 of the skills were taught at similar levels by teachers of two, three, or four of the vocational areas. The study further notes that the small number of similarities of instruction tended to support the establishment of comprehensive vocational education programs in local attendance centers. (JS)

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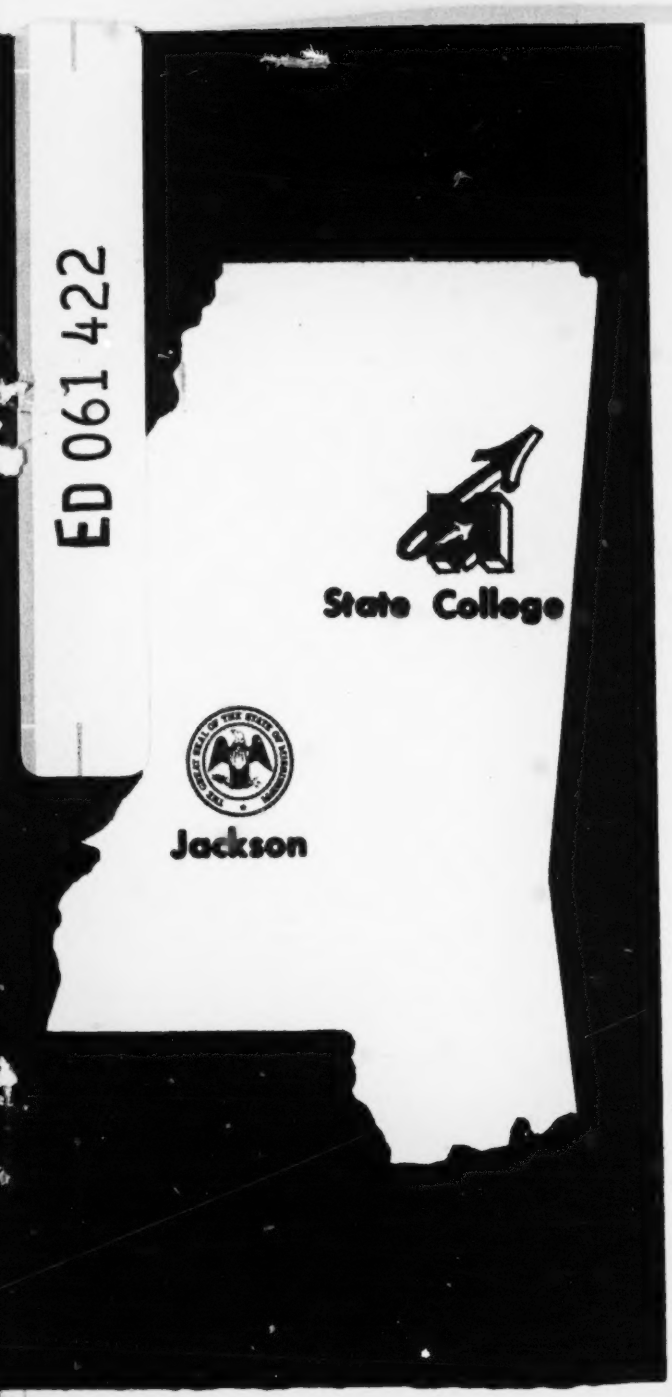

Levels and Similarities of Instruction in Selected Content Areas of Vocational Education

Jasper S. Lee

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- Stimulate
- Coordinate
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LEVELS AND SIMILARITIES OF INSTRUCTION IN SELECTED CONTENT AREAS OF VOCATIONAL EDUCATION

by

Jasper S. Lee

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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PREFACE

The Research Coordinating Unit (RCU) at Mississippi State University supports various projects in its program of research in OCCUPATIONAL EDUCATION AND MANPOWER DEVELOPMENT. Each of these projects is focused upon the derivation of information that will be useful in the development of human resources. Information derived thus far in this research program is included in the following publications:

1. INFLUENTIAL FACTORS CONCERNING HUMAN RESOURCES IN MISSISSIPPI, by James E. Wall. Preliminary Report 11, Education Series 1.

2. RESEARCH IN HOME ECONOMICS GAINFUL EMPLOYMENT: FIVE PILOT PROJECTS IN MISSISSIPPI -- 1965-66, by Mildred R. Witt and James E. Wall. Preliminary Report 15, Education Series 2.

3. EMPLOYMENT OPPORTUNITIES AND COMPETENCY NEEDS IN NONFARM AGRICULTURAL OCCUPATIONS IN MISSISSIPPI, by James E. Wall, Obed L. Snowden, and A.G. Shepherd, Jr. Preliminary Report 16, Education Series 3.

4. EDUCATIONAL ASPIRATIONS, EXPECTATIONS, AND ABILITIES OF RURAL MALE HIGH SCHOOL SENIORS IN MISSISSIPPI, by James F. Shill. Report 24, Education Series 4.

5. CAREERS OF RURAL MALE HIGH SCHOOL SENIORS IN MISSISSIPPI: A STUDY OF OCCUPATIONAL INTERESTS, ASPIRATIONS, AND EXPECTATIONS, by James F. Shill. Report 26, Education Series 5.

6. SELF-APPRAISAL OF VOCATIONAL-TECHNICAL EDUCATION IN MISSISSIPPI BY LOCAL SCHOOL COMMITTEES AND INSTRUCTORS, by Arthur R. Jones, Jr. Report 30, Education Series 6.

7. OCCUPATIONAL EDUCATION AND MANPOWER DEVELOPMENT: A PROGRAM AND BIBLIOGRAPHY, by James E. Wall and James F. Shill. Administrative Report 3, Education Series 7.

8. EDUCATIONAL AND OCCUPATIONAL PROFILES OF BUSINESS EDUCATION GRADUATES OF MISSISSIPPI STATE UNIVERSITY: 1960-1968, by Shirley T. Alcantara. Report 32, Education Series 8.

9. SOCIO-ECONOMIC CHARACTERISTICS OF THE MISSISSIPPI CHOCTAW INDIANS, by John H. Peterson, Jr. Report 34, Education Series 9.

10. VOCATIONAL EDUCATION PROGRAMS FOR SPECIAL NEEDS STUDENTS IN SECONDARY SCHOOLS OF MISSISSIPPI, by Allen Terry Steed. Report 37, Education Series 10.

11. LEVELS AND SIMILARITIES OF INSTRUCTION IN CERTAIN CONTENT AREAS OF VOCATIONAL EDUCATION, by Jasper S. Lee. Report 8000, Research Series 1.

The assistance of many people in conducting the study herein reported on and in the preparation of this research report is greatly appreciated. Special appreciation is extended to Dr. Lloyd J. Phipps, Chairman, Department of Vocational and Technical Education, University of Illinois, for the time, assistance, and encouragement given during the study. Appreciation is also expressed to the following persons at the University of Illinois: Dr. Paul Hemp, Chairman, Division of Agricultural Education; Dr. Mary Mather, Chairman, Division of Home Economics Education; Dr. James L. Wardrop, Assistant Professor, Center for Instructional Research and Curriculum Evaluation; and Dr. Don Carver, Associate Professor, Department of Educational Administration.

Gratitude is expressed to the teacher educators at Mississippi State University who served as members of the informal skill selection committee. Thanks also go to the teachers of vocational education in Mississippi for their cooperation in completing and returning the instrument used in the study.

J.S.L.

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I. INTRODUCTION

Vocational education has become an integral part of the American public school system. Instruction is available in nearly all of the occupations presently found in modern society. The content taught in vocational education courses has usually been changed to keep abreast with the technological needs of society. These content changes have tended, however, to be along the lines of the traditional vocational education service areas of agricultural occupations, distributive occupations, home economics occupations, office occupations, and trade and industrial occupations. Persons employed in administrative and teaching positions have attempted to administer vocational education courses without adequate knowledge of the content taught and its similarity in the respective vocational areas.

Important decisions about public school vocational education are made by the authorities of the local districts, the states, and the nation. An awareness of the defects in the mechanics of decision making occurs as decisions are made.[1] Decisions could be made more effectively if what teachers are attempting to teach was known. A knowledge of what is taught should permit educators to make more realistic and up-to-date revisions in the total vocational education program on a statewide and on a local basis.

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[1]Herbert M. Hamlin, Public School Education in Agriculture (Danville, Illinois: The Interstate Printers and Publishers, Inc., 1962), foreword.

Administrators, teacher educators, and teachers frequently base all or portions of their philosophy of vocational education upon the instruction that they believe is being rendered by teachers of vocational education in the various vocational courses. Some educators assume that certain content taught in all vocational education courses is similar. Others assume that there is very little or no similarity in content taught in the various courses. The existence, identity, and intensity of similar instructional content have been unknown. Educational administrators involved in vocational education programs and teacher educators involved in the preparation of vocational teachers have based many administrative decisions and formed many philosophical principles upon these assumptions.

The Problem

The problem, stated in its simplest terms, was that of determining the content and similarity of instruction in teaching pupils the "ability to do" selected skills in various vocational education courses in secondary schools. Stated another way, the problem was: "Which selected skills do teachers of high school courses in agricultural occupations, distributive occupations, home economics occupations, office occupations, and trade and industrial occupations teach, and in what ways is the content taught similar?"

The Objectives

The primary objectives of this study were (1) to determine which of certain selected skills teachers of secondary level courses of

agricultural occupations, distributive occupations, home economics occupations, office occupations, and trade and industrial occupations are attempting to teach and (2) to determine whether or not there is any similarity in selected instructional content in the various vocational education courses in the secondary schools of Mississippi. Secondary objectives included determination of variability of instruction from school to school within each of the respective vocational education service areas and the determination of the level of proficiency which the teachers attempt to develop in pupils. Still another secondary objective, though of lesser importance in this study, was the determination of content taught for purposes of articulating post-secondary vocational education with secondary instruction.

Significance of the Problem

This research receives support from three diverse contemporary forces in education; namely, the interdisciplinary team planning approach, the differentiated staffing approach, and the tendency to discontinue certain vocational education programs and to initiate others.

A knowledge of the content taught in the various vocational education areas is a must for successful interdisciplinary team planning of vocational education. Much of the discussion relevant to interdisciplinary team planning is based merely on the assumption that there are similar areas of instructional content. The exact identification, intensity, and inclusiveness of similarities have been unknown. The vocational education areas included in this study are frequently a part of interdisciplinary team planning.

The differentiated staffing approach will be more satisfactorily administered when a knowledge of what teachers are attempting to teach is available. The tendency to add persons with less than professional degrees to the staffs of vocational education programs as technicians, teacher aides, assistants, or associate instructors presents special problems. Generally, the professional teacher is a college graduate knowledgeable in methods and techniques of teaching and classroom management and skilled in the technical aspects of a particular vocational education area. A foundation of general education underlies all of the professional training. The nonprofessional has had no such experiences. No requirements may have been placed upon his educational background. He is a representative of the skill he is teaching, e.g., mechanics or carpentry. Knowledge of what the professional teacher is teaching may indicate that it is unnecessary to hire the nonprofessional, skilled only in a particular trade.

Knowledge of the similarities of instruction in the five vocational education areas should asist the planners of vocational education programs in evaluating, restructuring, initiating, and perhaps discontinuing certain programs. Without sufficient information, programs of vocational education may be initiated when, in fact, existing programs are providing the instruction that the new program is designed to provide. The knowledge of similarities could be particularly valuable to local educational administrators contemplating the initiation of new vocational education courses in the secondary schools.

The vocational education areas of agricultural occupations, distributive occupations, home economics occupations, office occupations, and trade and industrial occupations all have as their function the development of knowledges and skills for entry into, or advancement in, gainful employment. Knowledge of the similar areas of instruction in vocational education may permit teachers, through team teaching and flexible scheduling, to be used in teaching the content in which they have the greatest competence.

Very few investigations have been made into the levels and similarities of instruction in vocational education. These investigations are needed. Abramson[2] has indicated that curriculum research should include among other things, delineation of the instructional content. He states that curriculum research should go beyond the evaluation of pupil outcomes through testing.

An instrument has been developed by Courtney[3] that can be used to establish the core of professional knowledges and abilities needed in teacher education programs in five vocational education areas. The areas included were trade and industrial occupations, office occupations, home economics occupations, agricultural occupations, and distributive occupations. The procedure involved in the development of the

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[2]David A. Abramson, "Curriculum Research and Evaluation," Review of Educational Research (Volume XXXVI, No. 1, February 1966), p. 394.

[3]E. Wayne Courtney, The Identification and Comparison of the Common Professional Training Needs and Requirements for Teachers of Vocational Education (Menomie, Wisconsin: Stout State University, March 1967), Microfiche ED-010-845.

instrument included the reviewing of courses required for the preparation of vocational teachers. A composite list of all knowledges and skills unique to each of the disciplines was made. A group of consultants selected the knowledges and skills to be included in the instrument. The final list, as selected by the consultants, included 200 knowledges and skills. Final development of the instrument involved the development of a Likert scale for each item to be used in rating the need for each knowledge and skill in the worker's job.

Effort has been made by Van Camp[4] to incorporate commonalities in vocational education into a topical outline. She attempted to bring together topics which are of concern to all vocational educators in the respective vocational education disciplines.

Davis[5] indicated that there was a large area of commonality in vocational education courses. The question she raised was "Are there enough areas of overlap in course content to justify a common offering?" The commonality which Davis discussed extends into the objective of the instructional content which was "to prepare persons for and enable them to progress in socially useful occupations."

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[4]Donna M. Van Camp, "Commonalities in Vocational Education," Illinois Teacher of Home Economics, Volume VIII, Number 1, pp. 23-32.

[5]Winifred Davis, "A Look at Some Commonalities in Vocational Education," Illinois Teacher for Contemporary Roles, Volume XII, Number 2, Fall 1968-69, pp. 82-84.

In a pilot program in Kansas, Agan[6] attempted to remove the duplication from all regular vocational education programs and put it into a course called "commonalities." Such an integrated vocational education program was used to identify the common and differential aspects of vocational education.

Saden[7] indicated that occupational preparation should be integrated with academic development in the curriculum. The occupational preparation may provide a common core that can be used throughout the curriculum.

Many studies have attempted to discover the competency needed by various persons in the performance of their occupations. Dillon[8] attempted to determine whether separate courses were needed for workers employed in certain related businesses. A study by Fiscus[9] made a

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[6]R. J. Agan, A Coordinated and Integrated Program of Occupational Information, Selection, and Preparation in a Secondary School (Manhattan: Kansas State University, 1968).

[7]Samuel J. Saden, "Vocation-Core Training," Education, Volume 86, Number 6, February 1966, pp. 367-369.

[8]Roy Dean Dillon,"Comparison of Certain Abilities Needed by Workers in Licensed Ornamental Horticulture Businesses" (unpublished Ed.D. thesis, University of Illinois, 1965).

[9]Keith Eugene Fiscus, "A Comparison of Certain Knowledges in Agriculture Needed by Workers in Farming, in Grain Elevator Businesses, and in Agricultural Equipment Businesses" (unpublished Ed.D. thesis, University of Illinois, 1965).

comparison of certain knowledges needed by workers employed in three agricultural occupations. Other studies, including those by Albracht, Anderson, Mitschele, and Parsons,[10] have been made to determine the competencies needed by workers.

Definition of Terms

Certain terms used in this study were defined to prevent misinterpretation by the reader and to make the study more easily understood. The terms and their respective definitions are given below:

Vocational Education -- Public school education administered on the local level but supervised by a state board for vocational education and operating under the provisions of a state plan submitted in compliance with certain federal legislation. Such education is designed to fit individuals for gainful employment in nonprofessional level jobs. This includes, among others, education in agricultural occupations, distributive occupations, home economics occupations, office occupations, and trade and industrial occupations. Certain pupils completing such education may not enter gainful employment immediately but instead may enter more advanced programs of vocational education.

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[10] James A. Albracht, "A Process for Determining Vocational Competencies for the Performance of Essential Activities for the Sales Function by the Sales Personnel in the Feed Industry, and the Loci at Which the Competencies Could be Taught" (unpublished Ph.D. thesis, Michigan State University, 1966). Ober J. Anderson, "Competencies in Farm Credit Needed by Farmers" (unpublished Master's thesis, Iowa State University, 1966). Walter Mitschele, "Competencies in Animal Science Needed by Vocational Agriculture Instructors" (unpublished Master's thesis, Iowa State University, 1965). Warren Parsons, "An Analysis of Training Needs and Employment Characteristics of the Greenhouse Grower in Three Metropolitan Areas" (unpublished Ed.D. thesis, Michigan State University, 1966).

Agricultural Occupations -- The name of a program of instruction in agriculture designed to meet the needs of persons who are preparing to enter any occupation which requires knowledges and skills in agricultural subjects. Competencies are developed in agricultural production, agricultural resources, agricultural mechanics, agricultural products, agricultural supplies, ornamental horticulture, forestry, and other agricultural areas.

Distributive Occupations -- The name of a program of instruction in marketing, merchandising, and management for persons who wish to enter distributive occupations.

Home Economics Occupations -- The name of a program of instruction designed for persons who are preparing to enter useful employment in the home or gainful employment in an occupation involving knowledges and skills of home economics subjects.

Office Occupations -- The name of a program of instruction designed for persons who are preparing to enter occupations related to the functions of recording and retrieval of data, supervision and coordination of office activities, communication, and reporting of information.

Trade and Industrial Occupations -- The name of a program of instruction for persons who are preparing to enter a trade or industrial occupation. It includes any subject for the development of technical knowledge, manipulative skills, and related personal attributes needed for employment in such occupations.

Assumptions

Certain assumptions were made in order to clarify the problem. These were as follows:

First Assumption -- The content actually taught in secondary courses of agricultural occupations, distributive occupations, home economics occupations, office occupations, and trade and industrial occupations is identical to what teachers think they are teaching in such courses.

Second Assumption -- The responses teachers make to items on the instrument are representative of what they think they are teaching in the various vocational education courses.

II. RESEARCH METHODOLOGY

Major Tasks in Conducting the Study

The major tasks in conducting the study were the following:

1. Definition of universe population.
2. Development of the instrument.
3. Pre-testing and submission of instrument to jury of experts.
4. Selection of sample population.
5. Submission of instrument to sample population.
6. Analysis of responses.
7. Compilation of results of study in written summary.

The Population

All teachers of agricultural occupations, distributive occupations, home economics occupations, office occupations, and trade and industrial occupations in the secondary schools of the State of Mississippi were included in the population. Secondary school teachers of health occupations and technical occupations were not included in the study. The small number of such teachers made their inclusion impractical. Teachers who had taught less than one year were excluded from the study because their limited experience might have prevented accurate response to the instrument. Teachers with less than professional degrees were also excluded. Table I shows the number of secondary schools with courses in vocational education and the number of teachers providing the instruction in 1968-69.

TABLE I

SECONDARY SCHOOLS WITH COURSES IN VOCATIONAL EDUCATION AND TEACHERS PROVIDING THE INSTRUCTION IN MISSISSIPPI, 1968-69.

Vocational Education Areas	Number of	
	Schools	Teachers
Agricultural Occupations	270	307
Distributive Occupations	30	30
Health Occupations	1	1
Home Economics Occupations	423	474
Office Occupations	20	19
Technical Occupations	1	1
Trade and Industrial Occupations	128	145

The geographic area of Mississippi was chosen for the study because of several reasons. By limiting the study to the area encompassed by one statewide administrative unit, there would be consistency of administrative policy. The need for an analysis of vocational education within the geographic area was great. The particular contiguous geographic area was also chosen because of travel and communicative distance involved. A study encompassing a larger geographic area possibly would have been confounded by additional legislation and the policies of other administrative units.

In selecting the sample population, the universe population was stratified according to the vocational education areas of agricultural occupations, distributive occupations, home economics occupations, office occupations, and trade and industrial occupations, with the teachers of the respective areas comprising the various strata. A random sample of 25 percent of the teachers in each of the strata of

agricultural occupations, home economics occupations, and trade and industrial occupations was selected as respondents for these vocational education areas. The entire strata of office occupations teachers and distributive occupations teachers were included in the study as respondents. The last two strata were so included because of the small number of such teachers.

Data and Instrumentation

The instrument used to determine the elements of similarity in the vocational education areas being studied was developed in consultation with an informal committee of teacher educators representing agricultural occupations, distributive occupations, home economics occupations, office occupations, and trade and industrial occupations. A list of skills was developed through the use of course outlines, teaching plans, and related materials pertinent to vocational education. The name of each skill was typed on a 4 x 5 card. The committee placed the cards on which the names of the skills were typed in two stacks. The first stack included the skills that the teacher educators believed to be taught by the teachers in the vocational education area they represented. The second stack included skills not taught by the teachers in the vocational education area they represented. Only instruction in the skills needed by most workers to perform their jobs, which the committee deemed to be similar in two or more vocational education areas, were included. This procedure was used by the committee as a means of delimiting the study.

The following skills were deemed to be similar in two or more vocational areas by the committee and were included in the instrument:

Selling

Grooming

Selecting a career

Steam cleaning

Installing electrical appliances

Forming sheet metal

Silver soldering

Using electric motors

Oxyacetylene cutting

Installing sewerage systems

Surveying

Grading products

Getting a job

Figuring bill of materials

Tool fitting

Forging

Brazing

Glazing

Selecting building construction materials

Using the telephone

Oxyacetylene welding

Exercising leadership abilities

Maintaining sewerage systems

Using storage batteries

Wiring electrical circuits

Riveting

Using first aid

Preserving wood

Repairing automobiles

Labeling products

Operating tractors

Bookkeeping

Using duplicating equipment

Practicing good etiquette

Using insecticides

Displaying products

Practicing personal hygiene

Soldering

Constructing with wood (carpentry)

Repairing electrical appliances

Using power metal-working tools

Maintaining water supply systems

Installing roofing materials

Arc welding

Hardsurfacing

Serving food

Selecting a wardrobe

Selecting heating and cooling systems

Maintaining heating and cooling systems

Painting

Constructing buildings

Practicing good citizenship

Using money and banking procedures

Maintaining electrical appliances

Landscaping

Maintaining tractors

Using office machines

Repairing agricultural machinery

Tungsten inert-gas welding

Constructing ductwork

Upholstering

Reading blueprints

Refinishing furniture

Laying brick or block (masonry)

Producing vegetables

Installing water supply systems

Selecting roofing materials

Laying out building foundations

Art cutting

Preparing food

Writing letters

Maintaining a wardrobe

Installing heating and cooling systems

Using inventory methods

Placing and finishing concrete

Repairing gasoline engines

Maintaining tires

Communicating orally

Using parliamentary procedure

Cutting meat

Using business forms and invoices

Housekeeping

Advertising

Repairing diesel engines

Selecting fuels and lubricants

Using credit

Stockkeeping

Using power wood-working tools

Practicing good human relations

Budgeting

Demonstrating products

Practicing ethics in business

The following skills contained on the original list were eliminated by the committee of teacher educators:

Using dictating equipment

Constructing clothing

Using service policies

Maintaining a lawn

Practicing good family relationships

Selecting home furnishings

Keeping records

Performing bindery work

Using photography

Caring for children

Using data processing

Assembling products

Installing insulation

Drafting

Practicing safety

Controlling weeds

Filing (office)

Operating agricultural machinery

Taking dictation

Constructing fences

Decorating interiors

Practicing good penmanship

Typewriting

Demonstrating merchandise

In addition to indicating the content taught, teachers were asked to indicate the degree of proficiency they attempted to develop in pupils. A Likert-type summated rating scale was devised for each

item on the instrument. A scale of one to five was used for each item to indicate the degree of proficiency as follows: 1 = no proficiency, do not teach; 2 = low proficiency; 3 = average proficiency; 4 = high proficiency; and 5 = very high proficiency. By allowing teachers to indicate the degree of proficiency they attempted to develop in pupils, it was possible to determine whether or not the teachers in the various vocational education areas attempted to develop their pupils to the same relative levels of proficiency. The instrument was submitted to a jury of experts for "face" and construct validation and necessary revision. Test-retest and internal consistency reliability of the instrument were determined by submitting it to a pilot sample of 30 vocational teachers. The same sample of teachers was used for both computations. The tentative instrument was submitted to the pilot sample to determine internal consistency reliability. A split half correlation coefficient was computed and the Spearman-Brown prophecy formula applied. The computed result was r =.99. The instrument was resubmitted to the same teachers four weeks later for the purpose of obtaining responses that could be used in computing test-retest reliability. The computed result was r =.89.

The instruments were printed on multi-colored paper with all teachers of the same vocational education area receiving instruments printed on paper of the same color. The colors were: agricultural occupations--white; distributive occupations--green; home economics occupations--yellow; office occupations--pink; and trade and industrial occupations--orange. This aided in proper identification of responses

with respective vocational education areas upon return of instruments. A sample instrument is located in Appendix A.

The instrument was submitted by mail to the teachers of vocational education included in the study. A letter accompanied each instrument explaining the purpose of the study and soliciting the cooperation of the teachers. A stamped, self-addressed envelope was enclosed for the convenience of the teachers in returning the completed instrument. Teachers not responding within two weeks were sent a reminder notice urging them to complete the instrument. Those not responding in two additional weeks were contacted for a personal interview to obtain the desired data.

Statistical Procedure

The statistical procedure involved the computation of a chi square for each of the selected skills. The procedure for computing chi square involved the construction of a contingency table for each of the selected skills. The contingency tables were constructed according to the following model:

	Very High	High	Average	Low	No Proficiency, Do Not Teach
Agricultural Occupations					
Distributive Occupations					
Home Economics Occupations					
Trade and Industrial Occupations					

Frequencies were tablulated according to the responses of the vocational education teachers on each of the selected knowledges and skills. The frequencies in each cell of the contingency table were summed and a chi square computed according to the following formula:

$$\chi^2 = N\left(\sum \frac{fo^2}{frfc} - 1\right)$$

In the preceding formula fo refers to observed frequencies, fr to the sum of frequencies in the respective rows of the contingency tables, and fc to the sum of frequencies in the respective columns of the contingency table.

The null hypothesis was as follows:

Ho: There is no difference in the skills taught by teachers of agricultural occupations, distributive occupations, home economics occupations, office occupations, and trade and industrial occupations.

The level of significance selected for this study was .20. Selection of this level of significance can be explained as follows: Accepting the null hypothesis indicated similarity. This rather high level of significance was to guard against incorrectly concluding that there was similarity of instruction in the vocational education courses.

The number of degrees of freedom was computed as follows: $df = (r - 1)(c - 1)$. The preceding formula for computing the degrees of freedom is interpreted as follows: r refers to the number of rows in the contingency table, and c refers to the number of columns in the contingency table.

The columns in the contingency tables which did not contain any tabulated frequencies were eliminated from the tables. The chi square value obtained after reducing the number of degrees of freedom was reduced proportionately to the number of columns eliminated. This action was to reduce the number of cells in the contingency tables that did not contain any frequencies and to improve the statistical analysis afforded by chi square.

The obtained chi square was interpreted as follows: A chi square that was not significant at the .20 level resulted in acceptance of the null hypothesis at this level of significance. The contingency tables constructed for the skills for which a significant chi square was obtained at the .20 level of significance were studied to determine the source(s) of discrepancy. Similarity of instruction in vocational education courses could be detected by observing the distribution of the tabulated frequencies. A great deal of discrepancy meant that there was not much similarity of instruction. The vocational education areas responsible for the discrepancy were eliminated from the contingency table and the chi square statistic was re-computed for the remaining vocational education areas, provided the mean level of "ability to do," or proficiency, that was taught was 2.00 or higher. The mean level of 2.00 was selected since this would indicate that the skills were taught at no less than a low level of "ability to do." This study was concerned only with skills that were taught. The level of significance continued to be .20. The number of degrees of freedom was recomputed for the adjusted contingency table. The null hypothesis

was unchanged from that stated above.

The chi square values obtained when the source(s) of discrepancy had been eliminated, and the chi square had been re-computed, were interpreted as follows: A chi square value that was significant at the .20 level of significance resulted in the rejection of the null hypothesis at this level of significance. A chi square value that was significant at the .20 level of significance resulted in acceptance of the null hypothesis at this level of significance.*

The mean level of "ability to do" was computed according to the following formula:

$$\frac{(f_{dnt})\ (1) + (f_l)\ (2) + (f_a)\ (3) + (f_h)\ (4) + (f_{vh})\ (5)}{N} = M$$

This formula is interpreted as follows:

f_{dnt} = frequencies "do not teach"

f_l = frequencies "low" ability to do

f_a = frequencies "average" ability to do

f_h = frequencies "high" ability to do

f_{vh} = frequencies "very high" ability to do

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*A null hypothesis is never completely rejected. It is rejected only at a stated level of significance.

III. FINDINGS

The findings of this study were based on the responses of 278 secondary level teachers of vocational education included in the sample population. The instruments were mailed to members of the sample population. Thirty-one teachers in the original sample were disqualified because they had taught less than one year or had less than a professional degree. An additional sample population was randomly selected to replace those disqualified. Teachers not responding to the first instrument were mailed another instrument and a letter requesting their cooperation. Teachers not responding to the second mailing were personally contacted. Personal contact was used to obtain the responses or completed questionnaires from twenty teachers.

Professional Characteristics of Respondents

All of the teachers included had taught one year or more at the time the responses were received. Seventy-nine, or 28.42 per cent, had taught from one to five years. The remainder of the respondents, 199, or 71.58 per cent, had taught six or more years. Table II shows the number of years respondents had taught.

All of the teachers included in the study had professional degrees. Twenty-three of the respondents in the initial sample population, all of them trade and industrial occupations teachers, were excluded from the study because they did not have professional degrees. Additional teachers were drawn to replace those disqualified on the

TABLE II

NUMBER OF YEARS TEACHING EXPERIENCE
OF RESPONDENTS BY VOCATIONAL AREAS

Vocational Education Areas	Years of Teaching Experience: 1-5 Years		6 or More Years		Total	
	Number of Teachers	Per cent	Number of Teachers	Per cent	Number of Teachers	Per cent
Agricultural Occupations	25	32.46	52	67.53	77	100.00
Distributive Occupations	15	53.57	13	46.43	28	100.00
Home Economics Occupations	25	21.01	94	78.99	119	100.00
Office Occupations	3	17.65	14	82.35	17	100.00
Trade and Industrial Occupations	11	29.73	26	70.27	37	100.00
Total	79	28.42	199	71.58	278	100.00

basis of educational attainment. The greatest number of teachers, 186 or 66.91 per cent, had bachelor's degrees, whereas 91, or 32.73 per cent, had master's degrees. Only one teacher, or 00.36 per cent, indicated educational attainment beyond the master's degree. Table III shows the educational level of the teachers included in the study.

TABLE III

EDUCATIONAL LEVEL OF TEACHERS BY
VOCATIONAL EDUCATION AREAS

Vocational Education Areas	Educational Level of Teachers							
	Bachelor's		Master's		Educational Specialist		Total	
	Number of Teachers	Per cent	Number of Teachers	Per cent	Number of Teachers	Per cent	Number of Teachers	Per cent
Agricultural Occupations	49	63.64	28	36.36	0		77	100.00
Distributive Occupations	15	53.57	13	46.43	0		28	100.00
Home Economics Occupations	84	70.59	35	29.41	0		119	100.00
Office Occupations	10	58.82	7	41.18	0		17	100.00
Trade and Industrial Occupations	28	75.68	8	21.62	1	02.70	37	100.00
Total	186	66.91	91	32.73	1	00.36	278	100.00

Size of school enrollments in high schools in which respondents taught varied considerably. Ninety-two, or 33.09 per cent of the teachers, were teaching in schools with enrollments of 300-599 pupils. Seventy, or 25.18 per cent, were teaching in schools with 600-999 pupils; 61, or 21.94 per cent, were teaching in schools with 100-299 pupils; 40, or 14.39 per cent, were teaching in schools with 1,000 or more pupils; and 15, or 5.40 per cent, were teaching in schools with less than 100 pupils total enrollment. The vocational education courses, except distributive occupations and office occupations, were taught in schools of all sizes. Distributive occupations were not taught in any schools with less than 100 pupils; likewise, office occupations were not taught in any schools with less than 299 pupils. Table IV shows the sizes of the schools by vocational education areas.

Levels of Instruction

The major question this study was designed to answer is "Which of the selected skills do teachers teach in courses of agricultural occupations, distributive occupations, home economics occupations, office occupations, and trade and industrial occupations; and are there similarities in the instructional content among the courses in these areas?" The findings pertaining to which of the skills the teachers taught will be presented first.

Teachers of vocational education included in the sample population indicated the level of proficiency they attempted to teach pupils the selected skills by using a Likert-type scale. The alternatives for

TABLE IV

SIZE OF SECONDARY SCHOOLS BY VOCATIONAL EDUCATION AREAS
IN WHICH RESPONDENTS WERE TEACHING

Vocational Education Areas	Size of Schools: Less Than 100		100-299		300-599		600-999		1,000 +		Total	
	Number of Schools	Per cent	Number of Schools	Per cent	Number of Schools	Per cent	Number of Schools	Per cent	Number of Schools	Per cent	Number of Schools	Per cent
Agricultural Occupations	5	6.49	25	32.47	30	38.96	15	19.48	2	2.60	77	100.00
Distributive Occupations	0		1	3.57	9	32.14	11	39.29	7	25.00	28	100.00
Home Economics Occupations	7	5.88	30	25.21	45	37.82	28	23.53	9	7.56	119	100.00
Office Occupations	0		0		3	17.64	7	41.18	7	41.18	17	100.00
Trade and Industrial Occupations	3	8.11	5	13.51	5	13.51	9	24.32	15	40.55	37	100.00
Total	15	5.40	61	21.94	92	33.09	70	25.18	40	14.39	278	100.00

each skill included on the scale were "no proficiency, do not teach"; "low proficiency"; "average proficiency"; "high proficiency"; and "very high proficiency." An item was assumed to be taught if any alternative other than "no proficiency, do not teach" was chosen by the respondents. Each of the proficiency levels was assigned a number ranging from one for "no proficiency, do not teach" to five for "very high proficiency." A mean level of proficiency for each skill included on the scale was computed for each of the vocational education disciplines. An aggregate mean including all the vocational disciplines was also computed for each skill. The computed means can be interpreted as follows: The larger the numerical value of the mean the higher the level of proficiency the teacher attempted to teach the "ability to do." A mean of 1.00 indicated that none of the teachers included in the sample population taught that particular skill. A mean near 1.00 indicated that few of the teachers taught the skill and many of those who did, taught it for a low level of proficiency. Table V presents a summary of the means of the respective vocational education areas for each of the skills studied and an overall mean for all of the vocational education areas for each of the skills.

None of the skills had an aggregate mean level of proficiency for all vocational education areas of 4.00 or above. Fourteen skills had an aggregate mean of 3.00 or above. All fourteen were taught by teachers of all vocational education areas with none of the individual areas teaching at below the 2.00 level of proficiency. Twenty-eight of the skills were taught in all vocational education areas with an aggregate mean of 2.00 to 2.99. Fifty of the skills had an aggregate

TABLE V

SKILLS TAUGHT AND MEAN LEVEL OF PROFICIENCY RESPONDENTS ATTEMPTED TO TEACH BY VOCATIONAL AREAS+

Skill	Vocational Education Areas										Mean Level All Vocational Education Disciplines	
	Agricultural Occupations		Distributive Occupations		Home Economics Occupations		Office Occupations		Trade and Industrial Occupations			
	N*	Mean	N*	Mean	N*	Mean	N*	Mean	N*	Mean	N*	Mean
Selling	77	2.558	28	4.321	119	1.403	17	2.118	37	1.730	278	2.104
Tool fitting	77	2.532	28	1.000	119	1.034	17	1.000	37	2.054	278	1.813
Grooming	77	2.662	28	4.036	119	4.496	17	4.471	37	2.595	278	3.734
Forging	76	2.013	28	1.000	119	1.000	17	1.000	37	1.162	277	1.300
Selecting a career	77	3.377	28	3.714	119	3.436	17	4.118	37	3.270	278	3.442
Brazing	77	3.364	28	1.000	119	1.067	17	1.000	37	1.811	278	1.791

+Mean level of proficiency taught is interpreted as follows: 1 = do not teach, 2 = low proficiency, 3 = average proficiency, 4 = high proficiency, and 5 = very high proficiency.
*Number of teachers.

TABLE V--Continued

Skill	Vocational Education Areas										Mean Level All Vocational Education Disciplines	
	Agricultural Occupations		Distributive Occupations		Home Economics Occupations		Office Occupations		Trade and Industrial Occupations			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Steam cleaning	77	2.883	28	1.000	119	1.202	17	1.000	37	1.432	278	1.665
Glazing	77	2.312	28	1.000	119	1.143	17	1.000	37	1.730	278	1.522
Forming sheet metal	77	1.987	27	1.000	119	1.000	17	1.000	37	1.459	277	1.336
Selecting building construction materials	77	3.584	28	1.036	119	1.429	17	1.000	37	2.865	278	2.187
Silver soldering	77	1.935	28	1.000	119	1.000	17	1.000	37	1.541	278	1.309
Using the telephone	77	1.377	28	3.464	119	3.151	16	4.625	37	2.216	277	2.650

TABLE V--Continued

Skill	Vocational Education Areas										Mean Level All Vocational Education Disciplines	
	Agricultural Occupations		Distributive Occupations		Home Economics Occupations		Office Occupations		Trade and Industrial Occupations			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Using electric motors	77	3.117	28	1.036	119	1.294	17	1.000	37	2.270	278	1.885
Oxyacetylene welding	77	4.026	28	1.036	119	1.000	17	1.000	37	1.946	278	1.993
Oxyacetylene cutting	77	4.052	28	1.036	119	1.000	17	1.000	37	2.054	278	1.989
Exercising leadership abilities	77	3.961	28	3.714	119	3.261	17	4.000	37	3.405	278	3.565
Installing sewerage systems	77	2.571	28	1.000	119	1.017	17	1.000	37	1.243	278	1.475
Maintaining sewerage systems	77	2.558	28	1.000	119	1.118	17	1.000	37	1.243	278	1.514

TABLE V--Continued

Skill	Vocational Education Areas										Mean Level All Vocational Education Disciplines	
	Agricultural Occupations		Distributive Occupations		Home Economics Occupations		Office Occupations		Trade and Industrial Occupations			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Surveying	77	2.701	28	1.000	119	1.042	17	1.000	37	1.811	278	1.597
Using storage batteries	77	2.494	28	1.000	119	1.042	17	1.000	37	1.514	278	1.500
Grading products	77	2.571	28	1.286	119	2.202	17	1.000	37	1.595	278	2.029
Wiring electrical circuits	77	3.727	28	1.000	119	1.118	17	1.000	36	2.194	277	1.975
Getting a job	77	3.442	28	4.107	119	3.151	17	4.471	37	3.892	278	3.712
Riveting	77	1.701	28	1.000	119	1.034	17	1.000	37	1.378	278	1.259
Figuring bill of materials	77	3.896	28	1.536	119	1.798	17	1.824	37	3.676	278	2.622
Using first aid	77	2.701	28	1.536	119	3.370	17	1.353	37	3.081	278	2.838

TABLE V--Continued

Skill	Vocational Education Areas										Mean Level All Vocational Education Disciplines	
	Agricultural Occupations		Distributive Occupations		Home Economics Occupations		Office Occupations		Trade and Industrial Occupations			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Repairing automobiles	76	2.408	28	1.179	119	1.000	17	1.000	36	2.111	276	1.540
Preserving wood	77	2.883	28	1.000	119	1.328	17	1.000	37	2.189	278	1.820
Installing electrical appliances	77	2.974	28	1.000	119	1.252	17	1.000	37	1.784	278	1.773
Maintaining electrical appliances	75	3.067	28	1.000	119	2.328	17	1.000	37	2.081	276	2.279
Labeling products	77	1.442	28	2.179	119	2.471	17	1.176	37	1.595	278	1.960
Landscaping	77	3.299	28	1.036	119	2.185	17	1.000	37	1.622	278	2.230
Operating tractors	77	3.584	28	1.000	119	1.000	17	1.000	37	1.270	278	1.752

TABLE V--Continued

Skill	Vocational Education Areas										Mean Level All Vocational Education Disciplines	
	Agricultural Occupations		Distributive Occupations		Home Economics Occupations		Office Occupations		Trade and Industrial Occupations			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Maintaining tractors	77	3.870	28	1.000	119	1.000	17	1.000	37	1.162	278	1.817
Bookkeeping	77	2.442	28	1.821	119	1.563	17	3.882	37	1.865	278	2.014
Using office machines	77	1.338	28	1.893	119	1.017	17	4.118	37	1.432	278	1.460
Using duplicating equipment	77	1.286	28	1.679	119	1.126	17	4.588	37	1.514	278	1.489
Repairing agricultural machinery	77	3.831	28	1.000	119	1.000	17	1.000	37	1.216	278	1.813
Practicing good etiquette	77	2.571	28	3.536	119	4.630	17	4.529	37	3.054	278	3.734

TABLE V--Continued

Skill	Vocational Education Areas										Mean Level All Vocational Education Disciplines	
	Agricultural Occupations		Distributive Occupations		Home Economics Occupations		Office Occupations		Trade and Industrial Occupations			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Tungsten inert gas welding	77	1.299	28	1.000	119	1.000	17	1.000	36	1.417	277	1.137
Using insecticides	77	3.636	28	1.000	119	1.689	17	1.000	37	1.216	278	2.054
Constructing ductwork	77	1.286	28	1.000	119	1.000	17	1.000	37	1.297	278	1.119
Displaying products	77	1.883	28	3.536	119	2.303	17	1.471	37	2.189	278	2.273
Upholstering	77	1.338	28	1.000	119	2.361	17	1.000	37	1.405	278	1.759
Practicing personal hygiene	77	2.571	28	3.679	119	4.504	17	4.000	37	3.108	278	3.669
Reading blueprints	77	2.675	28	1.214	119	1.807	17	1.000	37	3.054	278	2.104
Soldering	77	3.208	28	1.000	119	1.017	17	1.000	37	2.270	278	1.784

TABLE V--Continued

Skill	Vocational Education Areas										Mean Level All Vocational Education Discplines	
	Agricultural Occupations		Distributive Occupations		Home Economics Occupations		Office Occupations		Trade and Industrial Occupations			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Refinishing furniture	77	2.662	28	1.000	119	2.445	17	1.000	37	2.378	278	2.263
Constructing with wood (carpentry)	77	3.987	28	1.036	119	1.076	17	1.000	37	3.162	278	2.151
Laying brick or block (masonry)	77	2.571	28	1.036	119	1.000	17	1.000	37	2.919	278	2.018
Repairing electrical appliances	77	2.818	28	1.036	119	1.622	17	1.000	37	1.838	278	1.885
Producing vegetables	77	3.286	28	1.071	119	1.697	17	1.000	37	1.000	278	1.939
Using power metal working tools	77	3.039	28	1.036	119	1.025	17	1.000	37	2.162	278	1.734

TABLE V--Continued

Skill	Vocational Education Areas										Mean Level All Vocational Education Disciplines	
	Agricultural Occupations		Distributive Occupations		Home Economics Occupations		Office Occupations		Trade and Industrial Occupations			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Installing water supply systems	77	2.727	28	1.000	119	1.000	17	1.000	37	1.297	278	1.705
Maintaining water supply systems	76	2.816	28	1.000	119	1.084	17	1.000	37	1.297	277	1.574
Selecting roofing materials	77	2.481	28	1.000	119	1.193	17	1.000	37	2.568	278	1.701
Installing roofing materials	77	2.468	28	1.000	119	1.017	17	1.000	37	2.622	278	1.629
Laying out building foundations	77	3.208	28	1.000	119	1.101	17	1.000	37	3.135	278	1.939
Arc welding	77	4.078	28	1.000	119	1.000	17	1.000	37	1.973	278	2.054

TABLE V--Continued

Skill	Vocational Education Areas										Mean Level All Vocational Education Disciplines	
	Agricultural Occupations		Distributive Occupations		Home Economics Occupations		Office Occupations		Trade and Industrial Occupations			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Arc cutting	77	4.078	28	1.000	119	1.000	17	1.000	37	1.757	278	1.953
Hardsurfacing	77	2.935	28	1.000	119	1.008	17	1.000	37	1.459	278	1.540
Preparing food	77	1.364	28	1.107	119	4.731	17	1.000	37	1.189	278	2.734
Serving food	77	1.234	28	1.643	119	4.882	17	1.118	37	1.243	278	2.741
Writing letters	77	1.494	28	2.500	119	2.303	17	4.412	37	1.703	278	2.147
Selecting a wardrobe	77	1.468	28	3.000	119	4.555	17	3.588	37	1.486	278	3.169
Selecting heating, cooling systems	77	1.766	28	1.000	119	1.622	17	1.000	37	1.703	278	1.572
Maintaining a wardrobe	77	1.325	27	2.815	119	4.487	17	3.706	37	1.486	277	3.036
Installing heating, cooling systems	77	1.481	28	1.036	119	1.059	17	1.000	37	1.486	278	1.255

TABLE V--Continued

Skill	Vocational Education Areas										Mean Level All Vocational Education Disciplines	
	Agricultural Occupations		Distributive Occupations		Home Economics Occupations		Office Occupations		Trade and Industrial Occupations			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Maintaining heating, cooling systems	77	1.623	28	1.000	119	1.168	17	1.000	37	1.432	278	1.302
Using inventory methods	77	2.688	28	2.929	119	2.412	17	2.118	37	2.730	278	2.550
Painting	77	3.338	28	1.036	119	1.933	17	1.000	37	2.865	278	2.385
Placing, finishing concrete	77	3.377	28	1.000	119	1.000	17	1.000	37	2.270	278	1.827
Constructing buildings	77	3.169	28	1.000	119	1.034	17	1.000	37	2.919	278	1.871
Repairing gasoline engines	76	3.132	28	1.071	119	1.101	17	1.000	37	1.730	277	1.697
Practicing good citizenship	77	3.935	28	3.607	119	3.857	17	4.000	37	3.514	278	3.817
Maintaining tires	77	2.844	28	1.036	119	1.025	17	1.000	37	1.622	278	1.608

TABLE V--Continued

Skill	Vocational Education Areas										Mean Level All Vocational Education Disciplines	
	Agricultural Occupations		Distributive Occupations		Home Economics Occupations		Office Occupations		Trade and Industrial Occupations			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Using money and banking procedures	77	2.597	28	3.357	119	2.882	17	3.882	37	1.865	278	2.766
Communicating orally	77	2.844	28	3.821	119	3.176	17	3.647	37	2.865	278	3.047
Using parliamentary procedure	76	3.908	28	3.464	119	2.958	17	2.882	37	2.378	277	3.188
Using credit	77	2.896	28	3.643	119	2.950	17	3.059	37	1.919	278	2.874
Cutting meat	77	2.065	28	1.143	119	2.580	17	1.000	37	1.216	278	2.014
Stockkeeping	76	1.724	28	3.607	119	1.193	17	1.647	37	2.108	277	1.733
Using business forms and invoices	77	1.675	28	2.857	119	1.445	17	4.118	37	1.973	278	1.871

TABLE V--Continued

Skill	Vocational Education Areas										Mean Level All Vocational Education Disciplines	
	Agricultural Occupations		Distributive Occupations		Home Economics Occupations		Office Occupations		Trade and Industrial Occupations			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Using power woodworking tools	77	4.039	28	1.143	119	1.059	17	1.000	37	2.865	278	2.129
Housekeeping	77	2.390	28	2.607	119	4.454	17	2.765	37	3.135	278	3.417
Practicing good human relations	77	3.169	28	4.286	119	4.143	17	4.118	37	3.541	278	3.806
Advertising	77	2.158	28	4.000	119	1.832	17	2.000	37	1.892	278	2.345
Budgeting	77	2.701	28	3.286	119	3.782	17	3.118	37	2.297	278	3.194
Repairing diesel engines	77	1.558	28	1.036	119	1.000	17	1.000	37	1.297	278	1.198
Demonstrating products	77	1.883	28	3.571	119	2.832	17	1.529	37	1.973	278	2.450

TABLE V--Continued

Skill	Vocational Education Areas										Mean Level All Vocational Education Disciplines	
	Agricultural Occupations		Distributive Occupations		Home Economics Occupations		Office Occupations		Trade and Industrial Occupations			
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Selecting fuels and lubricants	77	3.481	28	1.000	119	1.076	17	1.000	37	1.919	278	2.842
Practicing ethics in business	77	2.649	28	3.786	118	2.203	17	4.588	37	2.649	277	2.693

mean level of proficiency taught of less than 2.00. The lowest aggregate mean for all skills was 1.119 for the skill "constructing duct-work." The highest aggregate mean of all the skills was 3.817 for "practicing good citizenship."

Each of the vocational education areas, except trade and industrial occupations, had skills with mean levels of proficiency of 4.00 or higher. Trade and industrial education had several skills with mean levels of proficiency of 3.00 or higher. Agricultural occupations had five skills with mean levels of proficiency of 4.00 or higher, distributive occupations had five, home economics occupations had nine, and office occupations had thirteen.

The teachers of the respective vocational education disciplines also indicated that certain skills were not taught. These skills had a mean level of proficiency of 1.000. Forty-nine skills had a mean level of 1.000 as the level of proficiency teachers of office occupations attempted to teach the "ability to do"; distributive occupations had 38; home economics occupations had 15; trade and industrial occupations had 1; and agricultural occupations had no skills with means of 1.000. A number of the skills had means of slightly more than 1.000, thus indicating that few teachers taught the skill and many of those who did usually taught it for a low level of proficiency.

Similarities of Instruction

The second part of the major research question was "...are there similarities in the instructional content among the vocational courses regarding the skills taught?" Similarity of instructional content

was determined by computation of the chi square statistic. The null hypothesis tested was, "There is no difference in the skills taught by teachers of the vocational education areas." The level of significance was .20.

The chi square statistical analysis, when computations included all five vocational education areas, resulted in the rejection of the null hypothesis for all skills. In other words, the chi square statistical computations based on the responses of the sample population at the .20 level of significance indicated that there was no similarity among the five vocational education areas regarding the skills taught or the level of proficiency at which they were taught. None of the skills were taught at similar levels of proficiency by teachers of agricultural occupations, distributive occupations, home economics occupations, office occupations, and trade and industrial occupations.

The contingency tables containing the tabulated frequencies of all skills were studied to determine the source(s) of discrepancy. The vocational education area(s) that appeared to be responsible for the discrepancy was (were) eliminated from the contingency tables and the chi square statistic was re-computed for the skills which had mean levels of teaching the "ability to do" of 2.00 or higher. The null hypothesis remained unchanged and the selected level of significance continued to be .20. Table VI shows the skills for which the chi square statistic was re-computed, the vocational education areas included, and the action taken on the null hypothesis based upon the obtained chi square value.

The chi square values obtained when the vocational education areas apparently responsible for the discrepancy in the contingency tables were eliminated resulted in acceptance of the null hypothesis for 15 skills. The level of proficiency at which these skills were taught was said tc be similar. The number of vocational education areas included in the re-computations varied from two to four for each skill. Instruction in the skill, "selecting a career," was found to be similar in four of the vocational education areas: agricultural occupations, distributive occupations, home economics occupations, and trade and industrial occupations. "Practicing good citizenship" was also found to be similar as taught by teachers of four vocational education areas: agricultural occupations, home economics occupations, office occupations, and trade and industrial occupations. Four of the skills were found to be similar in three of the vocational education areas. These were:

Exercising leadership abilities	agricultural occupations, distributive occupations, and office occupations
Using inventory methods	agricultural occupations, distributive occupations, and home economics occupations
Using parliamentary procedure	distributive occupations, home economics occupations, and office occupations
Communicating orally	agricultural occupations, home economics occupations, and trade and industrial occupations

Ten of the skills were found to be similar in two of the vocational education areas. Skills with similar levels of instruction in agricultural occupations and trade and industrial occupations were "grooming," "practicing good etiquette," and "advertising." Skills that were taught at similar levels of proficiency by teachers in distributive occupations and office occupations were "grooming," "getting a job," "communicating orally," and "practicing good human relations." Teachers of home economics occupations and trade and industrial occupations taught "practicing good etiquette" at a similar level of proficiency.

TABLE VI

SKILLS WITH MEAN LEVELS OF PROFICIENCY OF 2.00[1] OR ABOVE FOR WHICH CHI SQUARE WAS RE-COMPUTED, VOCATIONAL EDUCATION AREAS INCLUDED, AND THE ACTION TAKEN REGARDING THE NULL HYPOTHESIS

Skill	Vocational Education Areas Re-Computed*	Mean	N**	Computed Chi Square Value	Degrees of Freedom	Action Taken Toward Null Hypothesis	
						Accepted	Rejected
Tool fitting	A, E	2.947	114	54.5490	4		x
Grooming	A, E	2.754	114	5.2554	4	x	
	B, D	4.200	45	2.3220	4	x	
Selecting a career	A, B, C, E	3.460	261	13.3632	12	x	
Glazing	A, E	2.122	114	9.6330	4		x

*A = Agricultural Occupations, B = Distributive Occupations, C = Home Economics Occupations, D = Office Occupations, E = Trade and Industrial Occupations.

**N = Number of Teachers

[1]Mean level of proficiency taught is interpreted as follows: 1 = no proficiency, do not teach; 2 = low proficiency; 3 = average proficiency; 4 = high proficiency; and 5 = very high proficiency.

TABLE VI--Continued

Skill	Vocational Education Areas Re-Computed	Mean	N	Computed Chi Square Value	Degrees of Freedom	Action Taken Toward Null Hypothesis	
						Accepted	Rejected
Selecting building construction materials	A, E	3.438	114	25.9578	4		x
Using the telephone	B, C, E	3.010	184	48.9808	8		x
Using electric motors	A, E	2.824	114	23.4042	4		x
Oxyacetylene welding	A, E	3.412	114	60.9672	4		x
Oxyacetylene cutting	A, E	3.403	114	61.0128	4		x
Exercising leadership abilities	C, E	3.289	156	1.5132	4	x	
	A, B, D	3.909	122	7.1370	6	x	
Grading products	A, C, E	2.150	233	21.2729	8		x
Wiring electrical circuits	A, E	3.283	113	45.9910	4		x
Getting a job	A, C, E	3.364	233	31.5948	8		x
	B, D	4.244	45	2.2320	2	x	
Figuring bill of materials	A, E	3.824	114	14.6376	4		x
Using first aid	A, C, E	3.103	233	31.5948	8		x

TABLE VI--Continued

Skill	Vocational Education Areas Re-Computed	Mean	N	Computed Chi Square Value	Degrees of Freedom	Action Taken Toward Null Hypothesis	
						Accepted	Rejected
Preserving wood	A, E	2.659	114	24.4872	4		x
Labeling products	B, C, E	2.250	184	24.5456	8		x
Practicing good etiquette	C, D	4.617	136	.5712	2	x	
Displaying products	A, C, E	2.146	233	12.0461	8		x
Practicing personal hygiene	A, C, E	3.643	233	119.6921	8		x
Reading blueprints	A, E	2.790	114	27.1662	4		x
Soldering	A, E	2.903	114	36.0468	4		x
Refinishing furniture	A, C, E	2.506	233	31.6414	8		x
Constructing with wood (carpentry)	A, E	3.719	114	44.3232	4		x
Laying brick or block (masonry)	A, E	3.473	114	33.9264	4		x
Repairing electrical appliances	A, E	2.500	114	34.0974	4		x
Using power metal working tools	A, E	2.754	114	20.0184	4		x

TABLE VI--Continued

Skill	Vocational Education Areas Re-Computed	Mean	N	Computed Chi Square Value	Degrees of Freedom	Action Taken Toward Null Hypothesis	
						Accepted	Rejected
Installing water supply systems	A, E	2.263	114	57.6042	4		x
Maintaining water supply systems	A, E	2.318	113	49.6070	4		x
Selecting roofing materials	A, E	2.508	114	24.0654	4		x
Installing roofing materials	A, E	2.517	114	32.5356	4		x
Laying out building foundations	A, E	3.184	114	54.5832	4		x
Arc welding	A, E	3.570	114	64.1250	4		x
Arc cutting	A, E	3.324	114	62.6316	4		x
Hardsurfacing	A, E	2.307	114	32.9346	4		x
Using inventory methods	A, B, C, E	2.502	261	19.1574	12		x
	A, B, C	2.571	224	8.2432	8	x	
Constructing buildings	A, E	3.438	114	43.3998	4		x
Practicing good citizenship	A, C, D, E	3.840	250	13.7000	12	x	

TABLE VI--Continued

Skill	Vocational Education Areas Re-Computed	Mean	N	Computed Chi Square Value	Degrees of Freedom	Action Taken Toward Null Hypothesis	
						Accepted	Rejected
Using money and banking procedures	A, C	2.776	196	46.4128	4		x
Communicating orally	A, C, E	3.017	233	3.6115	8	x	
	B, D	3.755	45	4.2255	4	x	
Using parliamentary procedure	B, C, D	3.036	164	8.8068	8	x	
Using credit	A, C, E	2.768	233	39.7032	8		x
Using power wood-working tools	A, E	3.658	114	46.4094	4		x
Housekeeping	A, B, E	2.627	142	14.4556	8		x
Practicing good human relations	B, D	4.222	45	2.2770	4	x	
Advertising	A, E	2.087	114	5.7798	4	x	
Practicing ethics in business	B, D	4.088	45	5.9040	3		x
	A, C, E	2.422	232	16.1008	8		x

IV. SUMMARY, INTERPRETATION, AND RECOMMENDATIONS

Summary of Findings

The major findings of this study are summarized as follows:

1. Few of the skills included in this study were taught by secondary level teachers of vocational education at high to very high levels of proficiency.
2. A large number of the skills were taught by many of the vocational education teachers.
   A. Teachers of agricultural occupations taught all of the skills; however, a number of them were taught at rather low levels of proficiency.
   B. Teachers of trade and industrial occupations taught all but one of the skills studied. A number were taught at a low level of proficiency.
   C. Teachers of home economics occupations did not teach fifteen of the skills studied.
   D. Teachers of distributive occupations did not teach 38 of the skills studied.
   E. Teachers of office occupations did not teach 49 of the skills studied.
3. None of the skills studied were taught in all five vocational education areas at a similar level of proficiency.
4. Thirteen of the skills studied were taught at similar levels by teachers in two to four of the vocational education areas studied.

A. Two of the skills taught in four of the vocational education areas at similar levels of proficiency were:

(1) Selecting a career

(2) Practicing good citizenship

B. Four of the skills taught in three of the vocational education areas at similar levels of proficiency were:

(1) Exercising leadership abilities

(2) Using inventory methods

(3) Communicating orally

(4) Using parliamentary procedure

C. Seven of the skills taught in two of the vocational education areas at similar levels of proficiency were:

(1) Grooming

(2) Practicing good etiquette

(3) Advertising

(4) Getting a job

(5) Communicating orally

(6) Practicing good human relations

(7) Exercising leadership abilities

Interpretation of Findings

This study revealed relatively little similarity of instruction among the vocational education areas for the skills studied. Fifteen of the skills were taught at similar levels by teachers of two, three, or four of the vocational education areas. Observation of a list of these fifteen skills revealed that many of them involved interpersonal-

relations types of skills rather than manipulative types of skills. None of the fifteen skills taught at a similar level involved a high degree of manipulative or physical skill. Several of the skills that were found to be taught at similar levels probably were taught simultaneously with manipulative skills. For example, "practicing good citizenship" may be taught, knowingly, or unknowingly, along with a number of manipulative skills. It is possible that a skill such as "practicing good citizenship" could be taught in conjunction with other skills of a more physical nature rather than as a specific skill in a course of instruction.

Even though similarities of instruction were found for fifteen of the skills, this does not mean that all of the instruction in these particular skills was identical in each of the vocational education areas. The skills that were found to be similar may be similar only in general instructional content and actually different in specific instructional content. Each of the skills was probably taught in terms of the instructional content of each of the vocational education disciplines. Yet, there were certain basic principles which were probably the same regardless of the vocational area in which the instruction was given. For example, "selecting a career" was taught to pupils at a similar level by teachers of four of the vocational areas. There are certain basic principles that should be included in the instructional content in teaching "selecing a career," such as the physical requirements of an occupation or the conditions under which the work of an occupation is performed. There is also specific content which teachers

of the vocational areas would teach relating to the overall occupational focus of the vocational area. Teachers of agricultural occupations would teach specific content about selecting a career in agricultural occupations, whereas teachers of the other vocational areas would teach "selecting a career" in their specific areas. The similarities that were found may have been greater in general instructional content than in specific instructional content. To determine whether the similarities were general or specific was beyond the scope of this study.

The small number of similarities of instruction tended to support the establishment of comprehensive vocational education programs in local attendance centers. A vocational program with instruction in one or two of the vocational education service areas would not provide instruction in all of the skills. A vocational education program which has all five vocational education areas more likely would provide instruction in all of the skills. In many instances it may be necessary to consolidate schools to justify a comprehensive vocational education program. The current trend of establishing area vocational schools should help to strengthen vocational education programs in this respect. In the writer's opinion, it is unfortunate that local vocational programs often are partially or fully terminated in order to justify the establishment of the area vocational schools.

There was considerable variation in the level of proficiency at which the skills included in the study were taught in the vocational education areas. The skills more closely associated with the overall

objective of a vocational education area were taught at higher levels than were the same skills taught by the teachers of the other vocational areas. For example, "selling" and "advertising" were taught to pupils at higher levels of proficiency by teachers of distributive occupations than by teachers of the other vocational areas. To cite another example, "preparing food" and "serving food" were taught to pupils at higher levels of proficiency by teachers of home economics occupations than by teachers of the other vocational areas. The specific skills taught to pupils and the level of proficiency at which they were taught were consistent with the objectives most often associated with the vocational education being provided.

It was found that many of the vocational teachers were teaching a large number of the skills studied. The skills in the study were diverse in nature and required that teachers be technically competent to provide instruction in the many skill areas. A question might be raised concerning the education of the teachers who were to provide the instruction. It may be possible that some of the teachers were attempting to provide instruction in too many skills, thus reducing the quality of the instruction that was provided. It also may be possible that due to a lack of practical experience on the part of the teachers in the occupations in which the skills were to be used, they were not aware of the level of skill required, and hence performance that would be expected of persons employed in these occupations.

The level of proficiency at which pupils were taught certain skills may be affected by the other vocational courses taught in a

school and by the specific skills for which a teacher was employed to teach. Vocational teachers, especially trade and industrial occupations teachers, are frequently employed to teach skills pertinent to a specific occupation or small cluster of occupations. These teachers would tend to teach the skills associated with a specific occupation at a rather high level of proficiency. Other teachers in the same vocational education area, teaching skills pertinent to a different occupation or cluster of occupations, may not teach the same skills. For example, a number of trade and industrial occupations teachers taught "laying out building foundations" at a very high level of proficiency. Almost the same number of other trade and industrial occupations teachers did not teach "laying out building foundations." This example illustrates the wide range of levels of proficiency at which skills were taught to pupils in a vocational education service.

Some of the differences in the instruction may be in the level of occupational preparation for which the instruction was provided. Teachers of agricultural occupations may be providing generalized instruction, whereas teachers of trade and industrial occupations may be training for specific occupational roles. There was a tendency for trade and industrial occupations instructors to teach a smaller number of skills but these were taught at higher levels of proficiency. It was possible that the agricultural occupations teachers had different objectives for their instruction. For example, instruction in "arc welding" as given by an agricultural occupations teacher may be secondary to the occupational objectives for which the education is being provided.

Trade and industrial occupations teachers may be educating specifically for an occupation as an arc welder, whereas agricultural occupations teachers may be providing instruction in arc welding that would be valuable to persons working in agricultural occupations but not the major focus of the occupation. It was possible that the perceptions the teachers had of levels of proficiency varied according to the emphasis or major focus of the occupation for which they were educating.

Implications of the findings also pertain to the secondary objectives of the study. One of the secondary objectives was to determine the variability of instruction from school to school within each of the respective vocational education areas. Visual observation of the contingency tables for each skill revealed that there was considerable variation in instruction from school to school for certain skills in the same vocational education area. With other skills, the variation between schools was small, in the level at which a skill was taught by teachers of the same vocational area. Also there was frequently more variation between schools in the level at which a skill was taught by teachers of trade and industrial occupations than there was for the other vocational areas. This again may be due to the fact that often trade and industrial occupations teachers are employed to teach a specific skill or a small cluster of specific skills.

Another secondary objective of this study was to determine the selected content taught by vocational teachers for purposes of articulating post-secondary vocational education with secondary level instruction. It will be difficult to articulate instruction at the

post-secondary level with that provided at the secondary level for many of the skills because of the wide variation in instruction at the secondary level. Standardized curriculum guides for secondary vocational courses would help to reduce the variation that presently exists between schools within a state or part of a state. Such standardization tends to violate one of the basic principles of vocational education on the local level, which is that the program of instruction should be designed to meet the needs of the local school patrons. However, the need of the local patrons may be to have a secondary program of vocational education that is designed so that pupils may go directly into a post-secondary vocational education program.

Recommendations

The characteristics of the sample population in this study limit the generalizations that can be made. However, certain recommendations can be made based upon the findings of this study.

1. Administrative changes in the vocational education courses offered should take into consideration the skills that are taught and the similarity of the instructional content. Instructional content varies from school to school; therefore, it will be necessary for each school to determine the content taught locally. However content taught and similarity of the content should not be the only criteria on which administrative changes are made. Careful consideration also must be given to the educational needs of the community being served.

2. The initiation of courses in vocational education for the purpose of teaching "similarities" should be done only with extreme caution. It is often assumed that similarities exist, but this study has found that only a limited number of skills were taught in more than one vocational education area at a similar level. It is possible that a preferable approach would be to use team teaching and let the teacher with the expertise in a particular skill teach that skill.
3. Teacher educators need to recognize the large number of skills that teachers of the vocational education disciplines are attempting to teach. Teacher education curriculums should be designed to include the preparation of teachers who will be qualified to teach the skills which are taught at relatively high levels of proficiency.
4. Supervisors of vocational education teachers need to recognize the diversity of the skills that teachers of vocational education are teaching. Supervision that will be responsive to the needs of teachers in teaching these skills should be provided. The similarities in the instructional content also demand that supervisors attempt to provide the supervision and coordination necessary for team teaching. Teachers who indicated that they taught the skills studied might be assigned to teach the particular skills in a team-teaching arrangement. A skill that is taught by more than one teacher might be taught by the member of the teaching team who was most proficient in that skill. For example, "using parliamentary procedure" was taught by teachers in three of the vocational education areas. The teacher with the greatest competency in parliamentary procedure should be used on

the team to teach "using parlimentary procedure" to all the vocational education pupils who are taught skills in this area of instruction.

APPENDIX A

INSTRUMENT

VOCATIONAL EDUCATION SURVEY

OF

SKILLS TAUGHT

Instructions: This questionnaire is part of a study designed to obtain information about the skills you are teaching. More specifically, it is about the amount of emphasis you place on the "ability to do." Please indicate the responses which most nearly represent the level of proficiency you attempt to teach by circling the appropriate letter corresponding to your answer. Circle only one response for each item.

N = No Proficiency, Do Not Teach
L = Low Proficiency
A = Average Proficiency
H = High Proficiency
VH = Very High Proficiency

Answer all questions; answer them as correctly as possible. There are no right or wrong answers except as related to the level of proficiency you attempt to teach. If you do not teach the item, circle the "N."

The following are examples:

Boxing	N	L	A	(H)	VH
Skating	(N)	L	A	H	VH
Dancing	N	L	A	H	(VH)
Collecting insects .	N	L	(A)	H	VH

Remember, place a circle around the letter which best represents the level of proficiency you are attempting to teach your pupils. Indicate that you do not teach an item by circling N. Begin on the next page.

	Proficiency Level I Attempt to Teach Pupils				
	Do Not Teach	Low	Average	High	Very High
01. Selling	N	L	A	H	VH
02. Tool fitting	N	L	A	H	VH
03. Grooming	N	L	A	H	VH
04. Forging	N	L	A	H	VH
05. Selecting a career . . .	N	L	A	H	VH
06. Brazing	N	L	A	H	VH
07. Steam cleaning	N	L	A	H	VH
08. Glazing	N	L	A	H	VH
09. Forming sheet metal . .	N	L	A	H	VH
10. Selecting building construction materials . .	N	L	A	H	VH
11. Silver soldering	N	L	A	H	VH
12. Using the telephone . .	N	L	A	H	VH
13. Using electric motors .	N	L	A	H	VH
14. Oxyacetylene welding . .	N	L	A	H	VH
15. Oxyacetylene cutting . .	N	L	A	H	VH
16. Exercising leadership abilities	N	L	A	H	VH
17. Installing sewerage systems	N	L	A	H	VH
18. Maintaining sewerage systems	N	L	A	H	VH
19. Surveying	N	L	A	H	VH

		Proficiency Level I Attempt to Teach Pupils				
20.	Using storage batteries.	N	L	A	H	VH
21.	Grading products	N	L	A	H	VH
22.	Wiring electrical circuits	N	L	A	H	VH
23.	Getting a job.	N	L	A	H	VH
24.	Riveting	N	L	A	H	VH
25.	Figuring bill of materials	N	L	A	H	VH
26.	Using first aid	N	L	A	H	VH
27.	Repairing automobiles .	N	L	A	H	VH
28.	Preserving wood	N	L	A	H	VH
29.	Installing electrical appliances	N	L	A	H	VH
30.	Maintaining electrical applainces	N	L	A	H	VH
31.	Labeling products . . .	N	L	A	H	VH
32.	Landscaping	N	L	A	H	VH
33.	Operating tractors . . .	N	L	A	H	VH
34.	Maintaining tractors . .	N	L	A	H	VH
35.	Bookkeeping	N	L	A	H	VH
36.	Using office machines .	N	L	A	H	VH
37.	Using duplicating equipment	N	L	A	H	VH
38.	Repairing agricultural machinery	N	L	A	H	VH
39.	Practicing good etiquette	N	L	A	H	VH
40.	Tungsten inert-gas welding	N	L	A	H	VH

		Proficiency Level I Attempt to Teach Pupils				
41.	Using insecticides . .	N	L	A	H	VH
42.	Constructing ductwork .	N	L	A	H	VH
43.	Displaying products . .	N	L	A	H	VH
44.	Upholstering	N	L	A	H	VH
45.	Practicing personal hygiene	N	L	A	H	VH
46.	Reading blueprints . . .	N	L	A	H	VH
47.	Soldering	N	L	A	H	VH
48.	Refinishing furniture .	N	L	A	H	VH
49.	Constructing with wood (carpentry)	N	L	A	H	VH
50.	Laying brick or block (masonry)	N	L	A	H	VH
51.	Repairing electrical appliances	N	L	A	H	VH
52.	Producing vegetables . .	N	L	A	H	VH
53.	Using power metal working tools	N	L	A	H	VH
54.	Installing water supply systems	N	L	A	H	VH
55.	Maintaining water supply systems	N	L	A	H	VH
56.	Selecting roofing materials	N	L	A	H	VH
57.	Installing roofing materials	N	L	A	H	VH
58.	Laying out building foundations	N	L	A	H	VH

		Proficiency Level I Attempt to Teach Pupils				
59.	Arc welding	N	L	A	H	VH
60.	Arc cutting	N	L	A	H	VH
61.	Hardsurfacing	N	L	A	H	VH
62.	Preparing food	N	L	A	H	VH
63.	Serving food	N	L	A	H	VH
64.	Writing letters	N	L	A	H	VH
65.	Selecting a wardrobe . .	N	L	A	H	VH
66.	Maintaining a wardrobe .	N	L	A	H	VH
67.	Selecting heating and cooling systems	N	L	A	H	VH
68.	Installing heating and cooling systems	N	L	A	H	VH
69.	Maintaining heating and cooling systems	N	L	A	H	VH
70.	Using inventory methods .	N	L	A	H	VH
71.	Painting	N	L	A	H	VH
72.	Placing and finishing concrete	N	L	A	H	VH
73.	Constructing buildings .	N	L	A	H	VH
74.	Repairing gasoline engines	N	L	A	H	VH
75.	Practicing good citizenship	N	L	A	H	VH
76.	Maintaining tires . . .	N	L	A	H	VH
77.	Using money and banking procedures	N	L	A	H	VH
78.	Communicating orally . .	N	L	A	H	VH
79.	Using parliamentary procedures	N	L	A	H	VH

		Proficiency Level I Attempt to Teach Pupils				
80.	Using credit	N	L	A	H	VH
81.	Cutting meat	N	L	A	H	VH
82.	Stockkeeping	N	L	A	H	VH
83.	Using business forms and invoices	N	L	A	H	VH
84.	Using power woodworking tools	N	L	A	H	VH
85.	Housekeeping	N	L	A	H	VH
86.	Practicing good human relations	N	L	A	H	VH
87.	Advertising	N	L	A	H	VH
88.	Budgeting	N	L	A	H	VH
89.	Repairing diesel engines	N	L	A	H	VH
90.	Demonstrating products .	N	L	A	H	VH
91.	Selecting fuels and lubricants	N	L	A	H	VH
92.	Practicing ethics in business	N	L	A	H	VH

Place a ✓ in the correct space:

93. I have taught the following number of years:
    ____ Less than 1
    ____ 1-5
    ____ 6 or more

94. The highest degree I have is:
    ____ High School
    ____ Bachelors
    ____ Masters
    ____ Educational Specialist
    ____ Doctors

95. Total enrollment in the school in which I teach in grades 9-12 is:

____ Less than 100 pupils
____ 100-299 pupils
____ 300-599 pupils
____ 600-999 pupils
____ 1,000 or more pupils

96. Total enrollment in the school in all vocational education courses is:

____ Less than 50 pupils
____ 50-149 pupils
____ 150-249 pupils
____ 250-349 pupils
____ 350 or more pupils

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